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(73) Proprietor: MASSMOULD HOLDINGS LIMITED
Cosgrove Way
Luton Bedfordshire, LU1 1XL (GB)

(72) Inventor: Miskin, Brian Leslie
Solus Sutton
Sandy Bedfordshire (GB)

(74) Representative: Wisher, Michael Frederick et al
Urquhart-Dykes & Lord 47 Marylebone Lane
London W1M 6DL (GB)

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FIG. 1.

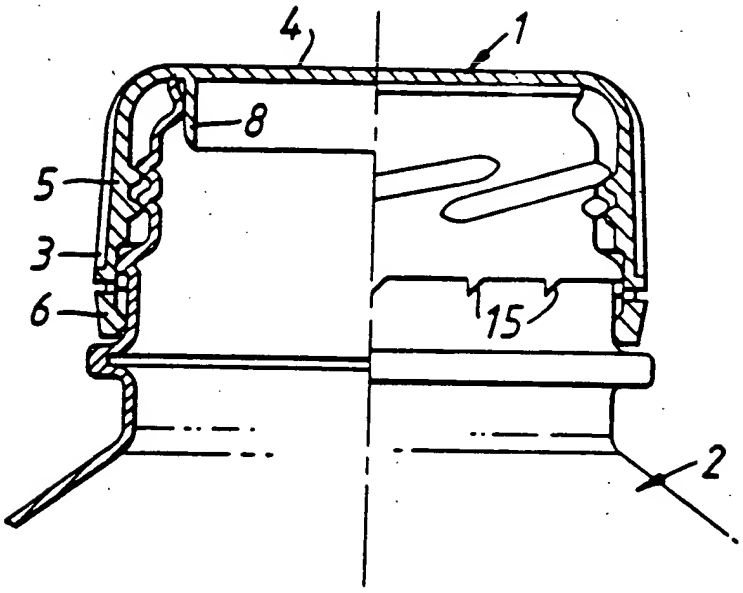


FIG. 2.

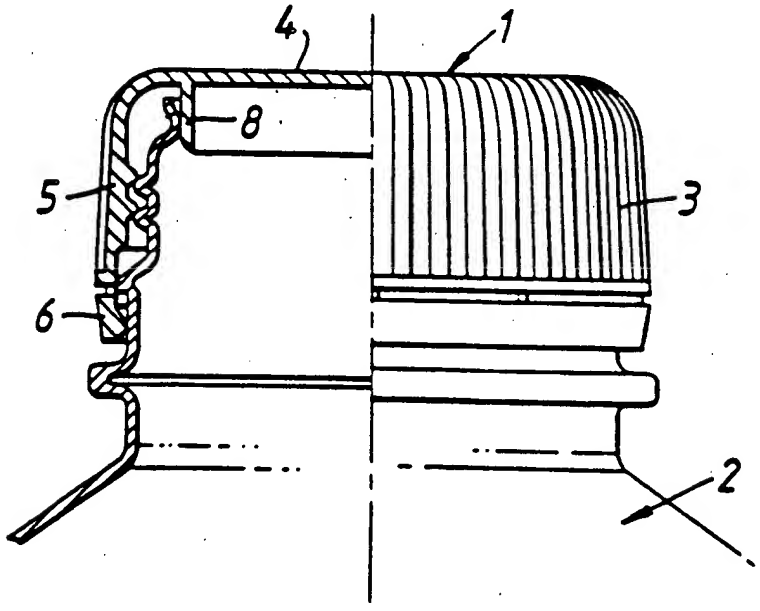


FIG. 3.

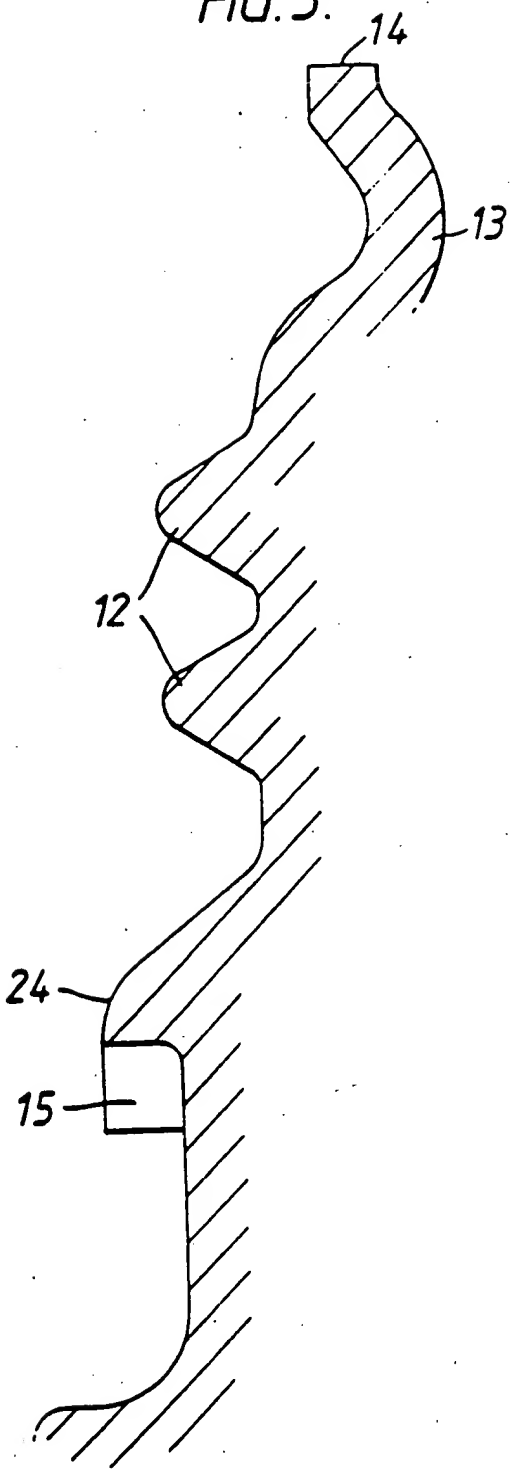


FIG.4.

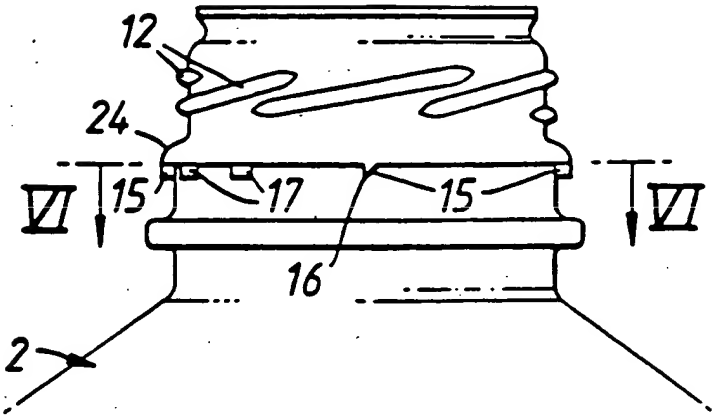


FIG.5.

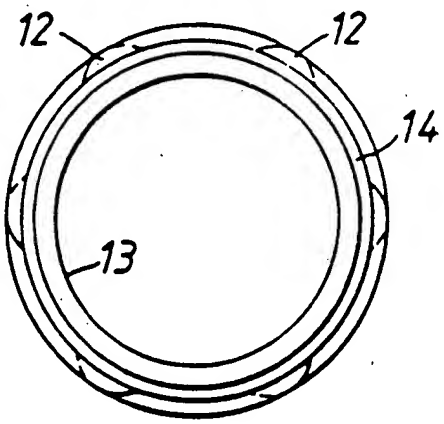


FIG.6.

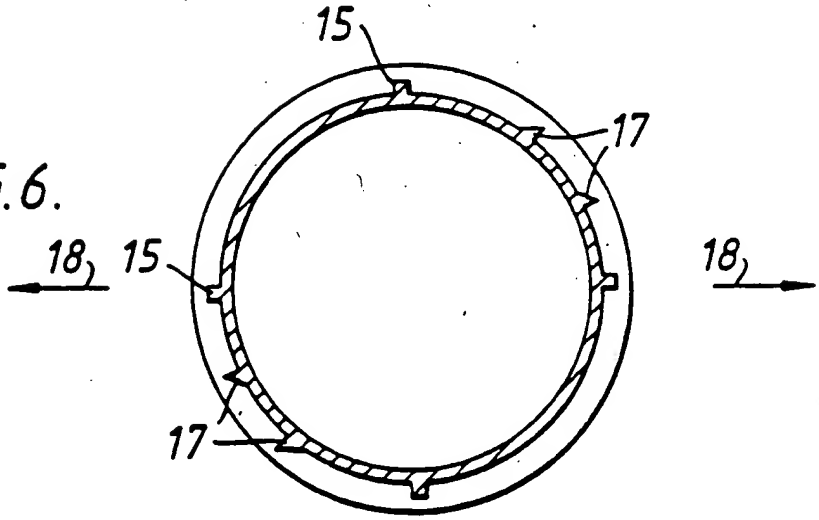
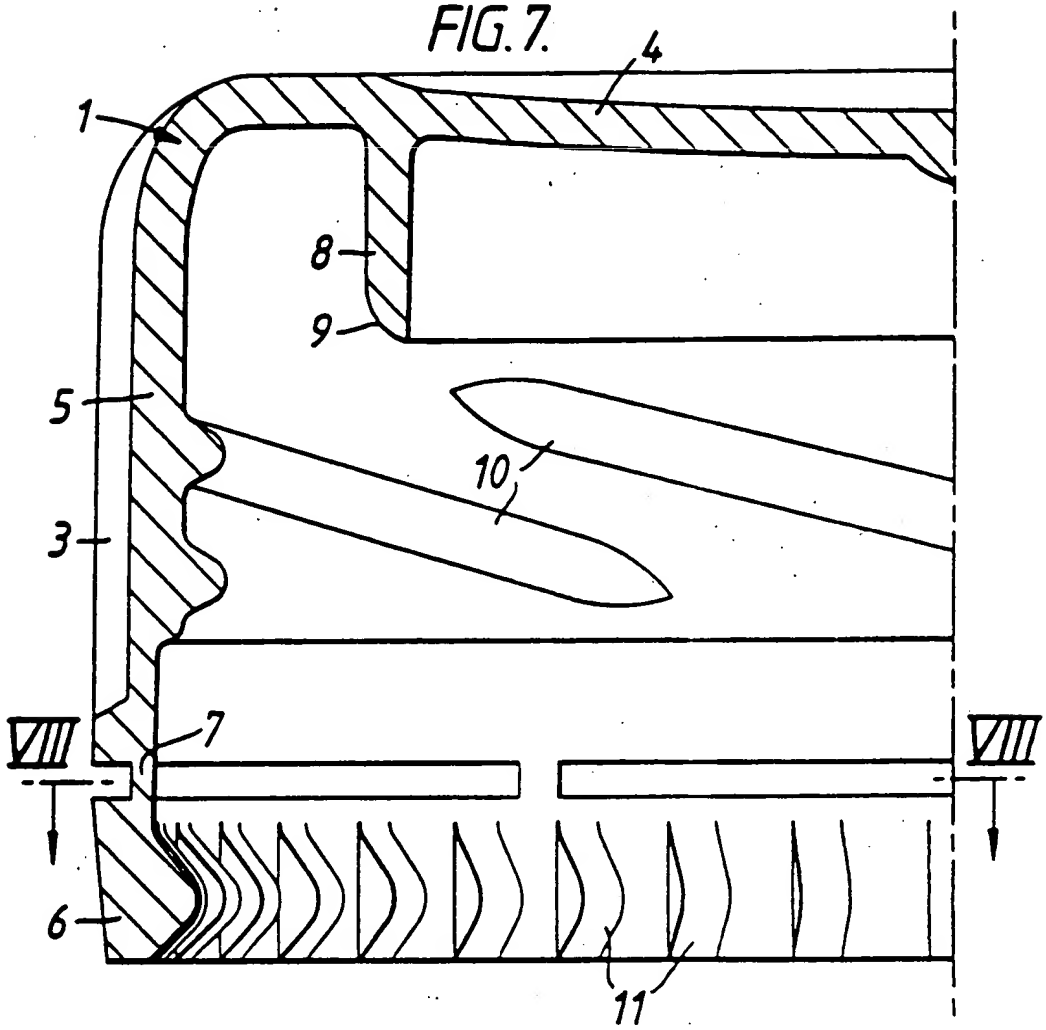


FIG.7.



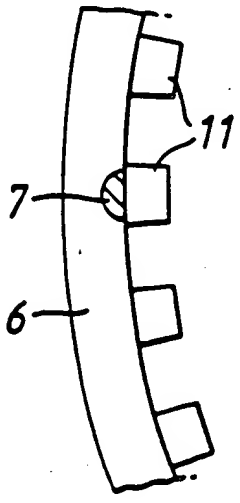


FIG.8.

FIG. 9.

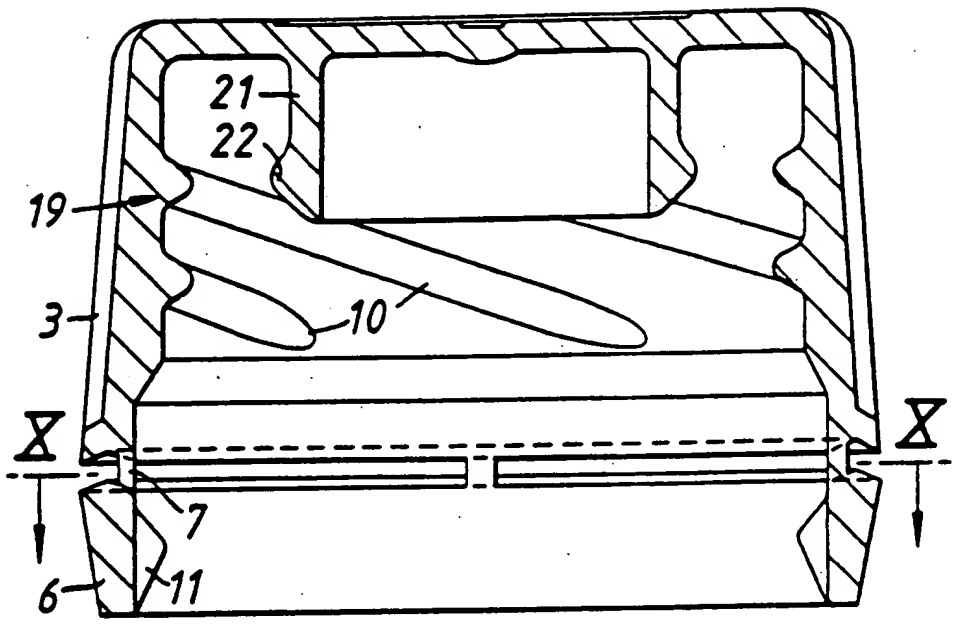
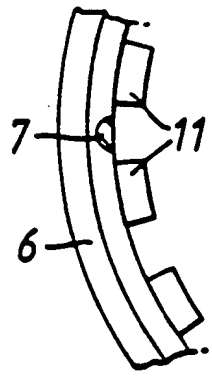


FIG. 10.



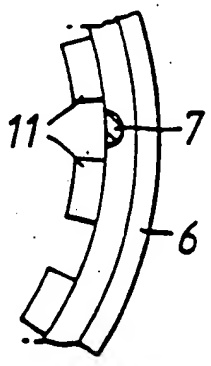
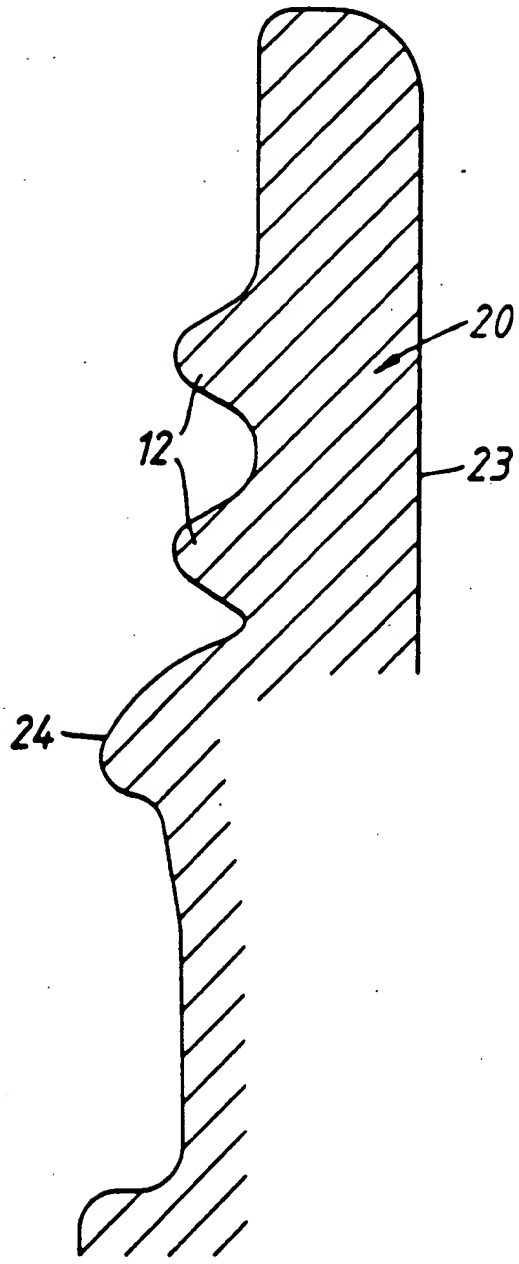


FIG.11.



Description

Introduction

This invention relates to a container and plastics closure therefor.

Prior Art

The prior art is replete with a multitude of constructions to enable a closure to be effectively secured to a container. Plastics closures and containers are well known and it is also known to provide a security band disposed around the free end of the skirt of the closure. The purpose of this security band is to provide evidence as to whether the closure has been taken off the container or not.

Screw-threaded engagement of the closure and the container is well known and it is also known to provide, on the inside of the closure, a plug which co-operates with the mouth portion of the container to form a seal when the closure is screwed home. A conventional closure positioning machine for fixing a closure with its sucurity band onto a filled container will have a rotating head which screws the closure home in the normal manner. It is, however, possible, dependent upon the material of which the closure is made and the dimensions and constuction of the closure and container, to assemble a closure on a filled container by a simple axial relative motion between the two whereby the screw threads are overridden. The closure positioning machine is thereby of more simple construction without any necessity of having to provide a rotary motion to the closure holding head. Previously, the disadvantage of this has been that the closure cannot be relied upon to exert top pressure on the sealing medium as its final position of thread engagement is random.

Object of the Invention

It is the main object of this invention to provide a container and closure therefor, at least the latter being of plastics, which enables the closure to be assembled on the container with a simple axial relative motion and in which the closure forms an adequate seal with the container when in position.

Statement of Invention

According to the present invention there is provided a container and closure therefor, at least the latter being of plastics, the neck portion of the container having external screw-threads for engagement with internal screw-threads on the skirt of the closure, in which the closure is capable of being applied to the container by an axial relative movement of the closure and container to override the interference of the threads, wherein the closure is provided with a plug extending from the inside surface of the base of the closure and capable of entering and forming a seal with the mouth portion of the container, the closure being provided with an integral annular security band joined by tearable webs to the free end of the closure skirt and the container being provided with annularly disposed nibs and a security band separating bead, characterised in that in the assembled condition of the container and closure, the security band is capable of lying on the container with variable axial clearance from the security band separating bead and the annularly disposed nibs, and the plug forms a seal over the required range of axial positions.

In a further feature of the invention the plug makes sealing contact with an inwardly projecting annular shoulder inside the mouth of the container over an adequate axial range. Alternatively, the plug is provided with an external annular bead which makes sealing contact with a straight sided mouth of the container over an adequate axial range.

Conveniently the container and closure both have multistart threads.

Conveniently the nibs on the container engage with castellations on the security band when the closure is unscrewed to tear the webs and release the closure from the security band.

The nibs and/or castellations may be provided with edges which are presented radially to the co-operating nibs and castellations on unscrewing the closure to assist in engagement. Also, all the nib engagement surfaces may be disposed radial to the bottle neck. The nibs may be shaped so as to enable the half-moulds used to form the container to be withdrawn.

Drawings

Two embodiments of container and closure in accordance with the invention will now be described, by way of example only, and with reference to the accompanying drawings in which:—

Figure 1 is a part-sectional view through a closure and container in accordance with the present invention showing the two parts in one assembled condition;

Figure 2 is a view similar to Figure 1 showing the two parts in an alternative assembled condition;

Figure 3 is an outline showing the configuration of the mouth and neck portion of the container of Figures 1 and 2;

Figure 4 is a side elevation of the neck and mouth portions of the container of Figures 1 and 2;

Figure 5 is a plan view of the container in Figure 4;

Figure 6 is a sectional view on the line VI—VI of Figure 4;

Figure 7 is an enlarged sectional view through a portion of the closure of Figures 1 and 2;

Figure 8 is a scrap section on the line VIII—VIII of Figure 7;

Figure 9 is a sectional view through a further embodiment of closure in accordance with the invention;

Figure 10 is a section on the line X—X of Figure 9; and

Figure 11 is an outline showing the configura-

tion of the mouth and neck portion of a further embodiment of container for use with the closure of Figures 9 and 10.

Specific Description

Referring first to Figures 1 to 8, a container and closure therefor in accordance with the invention are both made of any suitable plastics, for example low density polythene which is preferred or high density polythene or even polypropylene so long as the material used together with the dimensions of the container and closure particularly in relation to the screw-threads therefor enable axial relative movement between the two to position the closure on the container. Such method of positioning inevitably means that the screw-threads have to override each other but it does mean that simplification in the closure positioning machinery is achieved. Conventional unscrewing of the closure enables the closure to be removed from the container.

As seen in the drawings, there is provided a closure 1 and a container 2. The closure may be knurled or serrated at 3 to enable a good grip to be obtained when unscrewing the closure or repositioning the closure after it has been removed. The closure has a base 4 and a skirt 5 at the free end of the skirt there being provided an integral security band 6 attached to the skirt 5 by tearable webs 7 (see particularly Figure 7).

Projecting inwardly from the base 4 of the closure is a plug 8 which may have a rounded end at 9. Projecting from the inner wall if skirt 5 are internal screw-threads 10. In this particular embodiment a six start thread has been provided and preferably the thread is multistart.

The security band 6 has inwardly directed radial castellations 11 which can be seen particularly in Figures 7 and 8.

The container which is more particularly illustrated in Figures 3 to 6 has external screw-threads 12 for co-operation with the screw-threads of the closure. The mouth portion of the container is provided with an inwardly projecting annular bead 13 to form a line contact seal with the closure plug 8. The extremity 14 of the mouth of the container may be in the form of a pouring lip or not as desired.

On the outside of the container neck portion are a security band separating bead 24 and a series of outstanding nibs 15 with a radial surface 16. Each nib also has an angled surface 17, either from the lower axial edge or the circumferential edge, in the latter case at an angle to suit half mould opening dependent on the position of the nib. In the illustration the two halves of the mould on forming the container will be moved away from each other in the directions of arrows 18 as illustrated in Figure 6.

A closure and container constructed in accordance with the present invention enables the closure to be positioned on a filled container by a simple axial movement of the closure towards the container. The closure holding head of the machine may be free to rotate about the axis of the closure dependent upon the interference which is encountered as the two sets of threads override one another. During the axial positioning of the closure on the container the plug 8 makes a good sealing contact with the annular bead 13 of the container and because of the cylindrical nature of the plug 8 the seal will be effective regardless of the final position of the closure on the container. This final position will, of course, be dependent upon the interaction of the screw-threads and the orientation of the closure in relation to the container. Such orientation with automatic closure positioning equipment will be random. Thus the closure may come to rest in a position as illustrated in Figure 1 in which the closure is in the screwed fully home position although this position has been achieved not by screwing but by axial placement. On the other hand the closure may assume a position as illustrated in Figure 2 where the closure is far from being in the screwed fully home position but nevertheless an effective seal is achieved by virtue of the cylindrical plug 8 contacting the annular bead 13.

This variation in the ultimate positioning of the closure on the container is also permitted by the security band 6 being capable of lying with variable clearance from the security band separating bead 24 and the annularly disposed nibs 15 on the container. This clearance will be seen quite clearly in Figure 1. When the closure is positioned on the container it may well be possible slightly to move the closure in an axial direction without any loss of seal.

In order to remove the closure from the container and break the security band, a normal unscrewing movement of the closure is carried out. Eventually, on unscrewing the closure, the nibs 15 will engage the castellations 11 and by virtue of either the nibs 15 or the castellations 11 or both of them having a leading edge which is presented to the other member, the two co-operate to prevent further rotation of the security band. On further rotation of the closure and the restraint imposed on the security band by the nibs and at the same time bead 24, the webs 7 are ruptured and the security band 6 becomes detached from the closure 1. The closure 1 may then be completely unscrewed and removed from the container leaving the security band remaining in the container.

Although above it has been stated that the plug is cylindrical the outer surface of the plug 8 may have a draft in the order of ¼°.

Referring now to the further embodiment illustrated in Figures 9 to 11, like parts to the previously described embodiment have been given like reference numerals.

A closure 19 made of plastics (Figures 9 and 10) is for sealing a container 20 (Figure 11) of glass although even in this embodiment the container 20 may be of plastics.

The closure 19 has a plug 21 with an external annular bead 22 which makes sealing contact with the straight sided mouth portion 23 of the

container 20 over the desired axial range of positions.

The method of positioning and removing the closure on and from the container is as described in connection with the previous embodiment.

An added advantage of the construction of the present invention is that because only relative axial movement between the closure and container takes place on positioning of the closure, the tearable webs 7 are subjected only to compression and no circumferential shear so that there is no likelihood of them becoming broken at this stage. They can thus be made dimensionally smaller so as readily to rupture when subject to circumferential shear and tension on removal of the closure from the container.

Claims

1. A container (2) and closure (1) therefor, at least the latter being in plastics, the neck portion of the container having external screw-threads (12) for engagement with internal screw-threads (10) on the skirt (5) of the closure (1), in which the closure (1) is capable of being applied to the container (2) by an axial relative movement of the closure and container to override the interference of the threads (10, 12), the closure being provided with a plug (8, 21) extending from the inside surface of the base (4) of the closure and capable of entering and forming a seal with the mouth portion of the container, the closure being provided with an integral annular security band (6) joined by tearable webs (7) to the free end of the closure skirt and the container being provided with annularly disposed nibs (15) and a security band separating bead (24), characterised in that in the assembled condition of the container and closure, the security band (6) is capable of lying on the container with variable axial clearance from the security band separating bead (24) and the annularly disposed nibs (15), and the plug forms a seal over the required range of axial positions.

2. A container and closure therefor as claimed in Claim 1, in which the plug (8) makes sealing contact with an inwardly projecting annular bead (13) inside the mouth of the container over said axial range.

3. A container and closure therefor as claimed in Claim 1, in which the plug (21) is provided with an external annular bead (22) which makes sealing contact with a straight sided mouth (23) of the container over said axial range.

4. A container and closure therefor as claimed in any one of the preceding claims, in which the container and closure both have multi-start threads.

5. A container and closure therefor as claimed in any one of the preceding claims, in which the nibs (15) on the container engage with castellations (11) on the security band (6) when the closure is unscrewed to tear the webs (7) and release the closure form the security band.

6. A container and closure therefor as claimed in Claim 5, in which the nibs and/or castellations are provided with edges which are presented to the co-operating nibs or castellations on unscrewing the closure to assist in engagement.

7. A container and closure therefor as claimed in any one of the preceding claims, in which all the nib engagement surfaces are disposed radial to the container neck.

8. A container and closure therefor as claimed in Claim 7, in which the nibs are shaped so as to enable the half-moulds used to form the container to be withdrawn.

Patentansprüche

1. Behälter (2) und Verschluß dafür, wobei der letztere zumindest aus Kunststoff besteht und der Halsteil des Behälters Außenschraubgewinde (12) zum Ineinandergreifen mit Innenschraubgewinden (10) am Saum (5) des Verschlusses (1) besitzt, wobei der Verschluß (1) zum Überkommen der Behinderung durch die Gewinde (10, 12) durch eine axiale Relativbewegung des Verschlusses und Behälters auf den Behälter (2) aufgebracht werden kann, der Verschluß mit einem Stopfen (8, 21) versehen ist, der sich von der Innenfläche des Verschlußbodens (4) erstreckt und in den Öffnungsteil des Behälters eindringen und eine Abdichtung bilden kann, der Verschluß mit einem integralen ringförmigen Sicherheitsband (6) versehen ist, das durch zerreißbare Stege (7) mit dem freien Ende des Verschlußsaumes verbunden ist und der Behälter mit ringförmig angeordneten Zacken (15) und einem das Sicherheitsband trennenden Randwulst (24) ausgestattet ist, dadurch gekennzeichnet, daß in dem Zustand, wenn sich der Verschluß auf dem Behälter befindet, das Sicherheitsband (6) mit einem veränderlichen axialen Abstand von dem das Sicherheitsband trennenden Randwulst (24) und den ringförmig angeordneten Zacken (15) dem Behälter aufliegen kann und der Stopfen über den erforderlichen Bereich der axialen Positionen hinweg eine Abdichtung bildet.

2. Behälter und Verschluß dafür nach Anspruch 1, dadurch gekennzeichnet, daß der Stopfen (8) einen abdichtenden Kontakt mit einem nach innen vorragenden ringförmigen Randwulst (13) im Inneren der Behälteröffnung über den besagten Axialbereich hinweg herstellt.

3. Behälter und Verschluß dafür nach Anspruch 1, dadurch gekennzeichnet, daß der Stopfen (21) mit einem äußeren ringförmigen Randwulst (22) versehen ist, der einen abdichtenden Kontakt mit einer geradseitigen Öffnung (23) des Behälters über den besagten Axialbereich hinweg herstellt.

4. Behälter und Verschluß dafür nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß sowohl der Behälter als auch der Verschluß mehrgängige Gewinde besitzen.

5. Behälter und Verschluß dafür nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß die Zacken (15) an dem Behälter mit Kronierungen (11) am Sicherheitsband (6) ineinandergreifen, wenn der Verschluß zum Zer-

reißen der Stege (7) und zum Loslösen des Verschlusses vom Sicherheitsband abgeschraubt wird.

6. Behälter und Verschluß dafür nach Anspruch 5, dadurch gekennzeichnet, daß die Zacken und/oder Kronierungen mit Kanten versehen sind, die beim Abschrauben des Verschlusses zur Begünstigung des Ineinandergreifens auf die zusammenarbeitenden Zacken und Kronierungen gerichtet sind.

7. Behälter und Verschluß dafür nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß alle zum Ineinandergreifen benutzten Zackenflächen radial zum Behälterhals angeordnet sind.

8. Behälter und Verschluß dafür nach Anspruch 7, dadurch gekennzeichnet, daß die Zacken so gestaltet sind, dass die zur Formung des Behälters zur Anwendung kommenden Halbformen abgenommen werden können.

Revendications

1. Récipient (2) et fermeture (1) de celui-ci, la fermeture au moins étant en matière plastique et la partie de goulot du récipient comportant un pas de vis extérieur (12) destiné à se visser dans le pas de vis intérieur (10) de la jupe (5) de la fermeture (1), dans lequel la fermeture (1) est capable d'être appliquée sur le récipient (2) par un mouvement axial relatif de la fermeture et du récipient en surmontant l'obstruction des pas de vis (10, 12), la fermeture étant munie d'un bouchon (8, 21) partant de la surface intérieure de la base (4) de la fermeture et capable de pénétrer dans la partie d'embouchure du récipient en formant un joint d'étanchéité avec celli-ci, la fermeture étant munie d'une bands de sécurité annulaire (6), faisant corps avec celle-ci et se reliant par des membranes déchirables (7) à l'extrémité libre de la jupe de la fermeture, et le récipient étant muni de becs (15) disposés annulairement et d'un renflement (24) de séparation de la bande de sécurité, récipient et fermeture caractérisés en ce que, dans leur position assemblée, la bande de sécurité (6) peut venir se placer sur le récipient avec un jeu axial variable entre le renflement (24) de séparation de la bande de sécurité et les becs (15) disposés annulairement, et en ce que le bouchon forme un joint d'étanchéité sur la plage de positions axiales requise.

2. Récipient et fermeture selon la revendication 1, caractérisés en ce que le bouchon (8) forme un contact d'étanchéité avec un renflement annulaire (13) faisant saillie vers l'intérieur de l'embouchure du recipient, sur la plage axiale requise.

3. Récipient et fermeture selon la revendication 1, caractérisés en ce que le bouchon (21) est muni d'un renflement annulaire extérieur (22) formant un contact d'étanchéité avec une embouchure à bord droit (23) du récipient, sur la plage axiale requise.

4. Récipient et fermeture selon l'une quelconque des revendications 1 à 3, caractérisés en ce que le récipient et la fermeture comportent tous les deux des pas de vis à départs multiples.

5. Récipient et fermeture selon l'une quelconque des revendications 1 à 4, caractérisés en ce que les becs (15) prévus sur le récipient viennent s'engager dans des crénelures (11) prévues sur la bande de sécurité (6), lorsqu'on dévisse la fermeture pour déchirer les membranes (7) et libérer la fermeture de la bande de sécurité.

6. Récipient et fermeture selon la revendication 5, caractérisés en ce que les becs et/ou les crénelures sont munies de bords venant se présenter en face des becs ou crénelures correspondantes, lorsqu'on dévisse la fermeture, de manière à faciliter l'engagement.

7. Récipient et fermeture selon l'une quelconque des revendications 1 à 6, caractérisés en ce que toutes les surfaces d'engagement des becs sont disposées radialement par rapport au col du récipient.

8. Récipient et fermeture selon la revendication 7, caractérisés en ce que les becs sont formés de façon à pouvoir retirer les demimoules utilisés pour former le récipient.